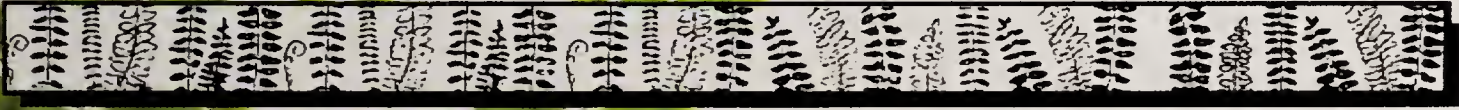




Hardy Fern Foundation Quarterly



Spring 2017

THE HARDY FERN FOUNDATION

P.O. Box 3797

Federal Way, WA 98063-3797

Web site: www.hardyferns.org

The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Affiliate fern gardens are at the Bainbridge Island Library, Bainbridge Island, Washington; Bellevue Botanical Garden, Bellevue, Washington; Birmingham Botanical Gardens, Birmingham, Alabama; Coastal Maine Botanical Garden, Boothbay, Maine; Dallas Arboretum, Dallas, Texas; Denver Botanic Gardens, Denver, Colorado; Georgia Perimeter College Garden, Decatur, Georgia; Inniswood Metro Gardens, Columbus, Ohio; Lakewold, Tacoma, Washington; Lotusland, Santa Barbara, California; Rotary Gardens, Janesville, Wisconsin; Strybing Arboretum, San Francisco, California; University of California Berkeley Botanical Garden, Berkeley, California; and Whitehall Historic Home and Garden, Louisville, Kentucky.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

Cover design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

THE HARDY FERN FOUNDATION QUARTERLY

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President's Message

As the first day of spring passes, I reflect on a long, cold and wet winter in the Northwest. I have been very envious of our members in the eastern US with several days above 60 degrees this winter and an early flush of blooms. Although, I know a few cold snaps had their toll on the East Coast's premature spring, the endless rain of this winter in the Northwest has left gardeners dreary and craving sunshine and warmth. It did allow some additional sorting of my digital picture files and it was wonderful to revisit fern images with robust and glowing new fronds. It reminded me of some of my favorites for fiddleheads, *Osmunda regalis* 'Purpurascens' and *Dryopteris namegatae*. The purple stemmed royal fern, *Osmunda regalis* 'Purpurascens', explodes from tight crowns with smooth brilliant reddish purple stems that quickly gain heights of 4 to 6 feet. The choice Japanese wood fern, *Dryopteris namegatae*, has emerging crosiers that are thickly covered in blackish brown hairy scales that give the feeling of a hairy octopus trying to escape from the soil. As I continue my slow move to a new 10-acre garden I must look for a location to add a drift or two of these fabulous ferns.

We are happy to announce the centennial celebration of the Hiram M. Chittenden Locks, locally known as the Ballard Locks. Run by the Army Corps of Engineers, the locks connect Lake Union, in the heart of Seattle, to Puget Sound and is a major thoroughfare for recreational and commercial boats. The Ballard Locks is also the home to the Carl S. English Jr. Botanical Gardens. Over 43 years Carl S. English Jr. built one of the most visited gardens in Seattle. The garden is full of rare and exotic treasures, as well as an extensive collection of western North American natives. Unfortunately, Mr. English passed away before the Hardy Fern Foundation was founded, but he had a profound effect on the organization's future. Carl English was responsible for getting our founding member, Sue Olsen, into growing ferns from spore by handing her a fertile frond of the then rare and commercially unavailable *Dryopteris erythrosora*, or autumn fern, and encouraging her to sow the spore. She ended up with 300 plants and a healthy addiction to ferns! Mr. English was also one of the first to discover and grow the dwarf western maidenhair fern, *Adiantum aleuticum* var. *subpumilum*, and he helped protect the wild populations by propagating and selling young plants through his small specialty nursery.

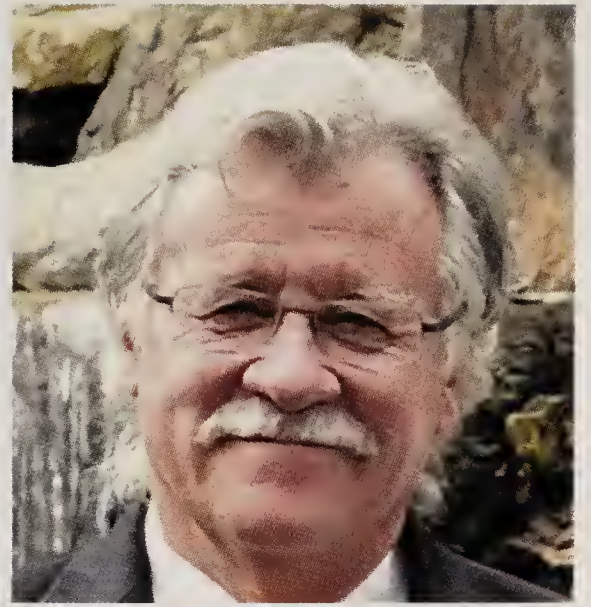
We will be at the Ballard Locks to celebrate this hallmark occasion by participating in a horticulture day at the Locks. Come by and visit May 21 from 1pm – 4pm, I will be there with other HFF board members along with other horticultural organizations and public gardens showing our support for this regional treasure.

All the best,

Richie Steffen
HFF President

The Joy of Classification – Lamentations of a Lumper or A Funny Thing Happened on the Way to the Herbarium

James R. Horrocks
Salt Lake City, UT



This article grew out of my awareness and concern that unfortunately some species are deemed taboo to write about due to raging controversies in the botanical world over their true identity or the identity or even reality of their subspecies or varieties. What follows are my own personal views and opinions backed up by comments from biologists and pteridologists and may or may not reflect the views of the Hardy Fern Foundation or fellow members of this organization. I apologize if I tread on anyone's feet or toes or sacred polypodies. It is not intentional.

There seems to be a basic and understandable human need to set in order and organize the natural world around us, to attempt to make sense of it all. The science of Taxonomy, as we call it today, began to emerge in the 1600's and clearly needed some guidelines of its own. Enter Carl Linnaeus, who in 1735, invented a system of classification that is still used today with some modifications. Organisms were grouped into categories according to similar traits. Those categories soon contained smaller categories as knowledge increased in biology. This was, to be sure, an artificial invention coming from the mind of man and it was a good invention as we really have no other basis in which to understand the living world around us. We are stuck with it despite its imperfections. But we must remember that it is artificial and not necessarily natural, for nature, at times, does not pay our system of classification much respect, as we shall see.

It is generally accepted on the surface that the category or unit of what we call "species" is the basic unit of classification and often the main focal point. Linnaeus maintained that species were fixed or immutable from the beginning but we must remember in fairness that this science was in its infancy and limited in its scope. Linnaeus, being a religious man, mistakenly equated "species" with "kind" in the Bible, apparently not realizing that the Hebrew word for "kind" merely signified "division", most likely a much broader concept. His equating it with species may have been hasty and certainly unfounded and subsequently created a lot of confusion and misunderstanding. Darwin, in his famous work *The Origin of Species*, challenged Linnaeus' assumption by insisting that species have changed through time and still change. The raging controversy today is not so much whether species change or adapt to some degree but whether the divergence of species portrays any kind of vertical upward evolution or is merely a manifestation of a horizontal oscillation about a mean. Indeed, J.A. Coyne, in an article in *Nature* maintains that Darwin's "...best known work is much more about the origin of adaptations than of species." {1} The well-known Harvard ornithologist Ernst Mayr seconded that opinion.

Furthermore, Hampton L Carson, in a review of “*Models of Speciation*” by M.J.D. White, tells us that “The search for truly incipient {emerging} species has been difficult and, to a considerable degree, frustrating.” {2}

The word “species” is derived from the Latin “specere” which means “to look at” or “to behold”. Words like “specific” and “specialize” have the same derivation. For just over four centuries, we in the modern world have been dividing living organisms into tidy categories we call species and maybe we have been too comfortable with that. Suddenly our tidy little world is jolted and troubled when we read: “...there is no consensus concerning what constitutes an appropriate definition or concept of species.” {3} or “...the very concept of species has fueled debate for decades. ‘There is no general agreement among biologist on what species are.’ says Jonathon Marshall, a biologist at Southern State University. At last count (as of 2008) there were at least 26 published concepts in circulation.” {4} or.... “The term species should be retained only in the original, less restrictive sense of ‘kind’. There seems to be no reason why quantitative methods should not be used to study phenetic relationships (those based on similarity rather than imagined phylogeny) at what we now loosely call the species level.” {5} Darwin himself wrote in 1856: “It is really laughable to see what different ideas are prominent in various naturalists’ minds, when they speak of species. It all comes, I believe, from trying to define the undefinable.... I look at the term ‘species’ as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other.” {4} Even G. G. Simpson admitted: “Darwin failed to solve the problem indicated by the title of his work.”

If that isn’t disconcerting enough, Ernst Mayr reveals: “It is not surprising to find how few authors have dared to define ‘genus’....no two authors are likely to agree as to what the ‘essential’ characters are. The best definition of a genus seems to be one based on the honest admission of the subjective nature of the unit.... The genus is a man-made unit, and not one of nature....left to the judgement of the individual systematist. The genus of the systematist is his own artificial creation, and not a natural unit. The same is true for the higher categories above genus....” {6} Van Gelder adds: “The genus...is thought to be an arbitrary division, a purely human construction, which may have no basis in nature. The idea that the genus is constructed for human convenience is clearly evident from such statements as, ‘In entomology there is sentiment in some quarters for setting an upper limit (perhaps 40) to the number of species allowed in a single genus’”. {7}

Obviously, the problem is that nature feels no obligation to neatly fit, tongue and groove, into our man-made system. The real world is more slippery and nature seems at times to deliberately mock us. Living organisms can seem either like a continuum where one species appears to flow seamlessly into another, or a group of organisms seem to stand alone without any obvious close relationship to anything else. In the fern world, the ostrich fern comes to mind, with only a faint affinity to other groups, *Onoclea* being possibly the closest. But the biggest problem is with species so close as to call into question whether they are even separate entities.

“‘Fuzzy species are common.’ says Rutger University geneticist Jody Hey. Taxonomists frequently disagree about how to determine where one species ends and

another begins. Ask the big question – ‘So what is a species anyway?’ – and you discover there is no universally accepted definition.” {8} In 2007 it was determined according to genetic evidence that the giraffe is actually comprised of, not one, but six or more species! It is disturbing that we have cryptic species hiding inside the tallest animal on earth. Wolves of the genus *Canis* present a nasty problem. Even experts are not exactly sure how to classify the several species which have been reclassified several times to the point that everyone is still confused. Adding to the mess is the fact that coyotes interbreed with wolves and all the wolves themselves interbreed. “When it comes to wolves and coyotes, it is hard to say quite where one species stops and another starts.” Bradley White at Trent University in Ontario, Canada says: “We like to call it *Canis* soup.” {4} While hybrids between mammals in the wild are rare, in captivity, there have been some interesting crosses. “Hybridization between lions (subgenus *Leo*) and tigers (subgenus *Tigris*), lions and leopards (subgenus *Panthera*), lions and jaguars (subgenus *Jaguaris*), between tigers and leopards, and between jaguars and leopards has been accomplished. Some of the offspring are fertile in these crosses, and the ability to hybridize bespeaks the genetic proximity of these species and questions their separation into genera or even subgenera.”! {7} Among *Bison* and related genera “Fertile offspring have resulted from crosses of (genus) *Bison* with *Bos indicus* as well as with *Bos Taurus* (cattle)...Hybrids between goats (*Capra*) and sheep (*Ovis*) have long been reported,” {and when it comes to birds,} “Naturally occurring intergeneric hybrids are far more common in birds than in mammals.” {7} Even Darwin’s famous finches in the Galapagos Islands are known to interbreed. Are we dealing with species or subspecies? Beak traits, that is, changes in size and shape of beaks in finch populations “is oscillating back and forth.” {9} It simply shows that there is variation according to environmental changes which fluctuate. And Darwin never did cite his finches as evidence of his theory of evolution.

This all leads us to the argument over what is the basic unit of classification. We are told by Hennipman that “The category of genus is the actual key rank....There is general agreement between authors....about the essential role of the generic rank in classification, also as the genus has such a great influence on the nomenclature of species. Kramer regarded the genus as ‘a basic, perhaps the basic, category of classification.’ ” {10}, {11} G.G. Simpson agrees, “the genus is, on the whole, the most definite and permanent unit of modern classification, to such an extent that the genus may be considered the basic unit of practical and morphological taxonomy, although the species is the basic unit of theoretical and genetical taxonomy.” {12} But O.W. Richards, in his review of *Principles of Systematic Zoology* by Ernst Mayr writes: “According to the author’s view, which I think nearly all biologists must share, the species is the only taxonomic category that has at least in more favorable examples a completely objective existence. Higher categories are all more or less a matter of opinion.” {13} Finally, and pertaining to ferns, Haufler says: “Species concepts and the modes and mechanisms of speciation are central issues in studies of the systematics and evolutionary biology of pteridophytes.” {3} Well, there you have it -- a mish-mash of opinions.

Now as we turn our attention to our beloved ferns, we are confronted with the same dilemma. When we consider all the hybridization going on amongst our promiscuous pteridophytes, it gives us serious pause. Knobloch listed over 100 hybrids in the genus

Asplenium, almost 50 in *Polystichum*, and over 80 in *Dryopteris*, to mention just a few. In his investigation of some 291 ferns, Knobloch found that 27% were “fertile or partly so.” {14} Then when we consider Britton’s article in the American Fern Journal entitled “*The Problems of Variation in North American Dryopteris*”, that says it all! {15} Nature, at times, just does not want to cooperate with our futile attempts to understand her. It’s like trying to catch butterflies in a wind storm.

Years ago, when I was giving a lecture on ferns at Red Butte Gardens, affiliated with the University of Utah, someone raised their hand and asked me how I remembered all the big botanical names I was rattling off. My answer was simply, “I don’t remember them, I just make them up as I go.” Well, it got a big laugh but if you think about it, some of the names conjured up by naturalists and botanists may depend more upon what they had for breakfast that morning or whether they had a good night’s sleep than on anything of more scientific significance. This brings me to another issue I have with our methods of classification. We name things in reference to other things but it can get out of hand. I have always taken a dim view of naming ferns after a person or a place. It’s nice to have something named after you or in honor of someone you emulate, but it isn’t descriptive or diagnostic of the specimen in question at all. *Woodwardia*, *Woodsia*, *Matteuccia*, and *Doodia* come to mind. *Polystichum tsus-simense*, named after the Island of Tsus-sima, presumably because it was first discovered there, I guess, may be alright if that is the only place it is found, but misleading when we realize that it is also found in Korea itself as well as China, Japan, Thailand, and Indonesia. *Woodsia oregana* and *Woodsia mexicana* are both found in Utah and probably other western states.

When it comes to using descriptive names, sometimes they can be useful. The species name “struthiopteris” or ostrich fern is very descriptive since the outline of the fronds suggests an ostrich plume. “marginalis” from *Dryopteris marginalis* is diagnostic in that the sori are close to or at the margins of the pinnules. I like the name *Polystichum*. It’s fun to say and I would have to admit that this genus is probably my favorite group of ferns. “Polystichum” means “many rows or stitches” and we fern fanatics all know what it is referring to, but the novice may ask: “Many rows of what? Pinnae, pinnules, teeth, sori? And besides, there are other genera of ferns that have sori in rows. Species names, “filiX-mas” and “filiX-femina” are based on erroneous beliefs about the sexuality of ferns and some names are just downright vague. We have ferns named after other ferns such as *Dryopteris neorosthornii*, named in reference to a fern named after a person. *Polystichum pseudo-makinoi* is in reference to *P. makinoi* and *Dryopteris pseudo-mas* refers to *D. filiX-mas*. Talk about pseudo-mania! The scientific method uses a term called “falsification”, irrelevant here. I’m waiting for someone out there to discover a species with very odd toothed segments. They might name it *Polystichum pseudo-serratum* meaning “many rows of false teeth”. The name *Dryopteris* means “oak fern” but they don’t necessarily grow only under oak trees and “pteris” is actually from the Greek “pteron” meaning “wing” in the strictest sense. Ferns look like feathers of a wing. The Anglo-Saxon word “fern” or “fearn” suggests a “feather”. Here again, we see that everything is named after or in relation to something else. Regrettably, in some instances we combine words that may not make any sense at all. The astonishing trans-generic hybrid between *Dryopteris goldiana* and *Polystichum lonchitis* has been dubbed “Dryostichum”. What in the name

of Carl Linnaeus does that mean? Perhaps a fern that lives only among oak trees that grow in rows, or maybe a fern with rows of sori that look like tiny oak leaves? Well, to be sure, I have reduced this to the point of absurdity, but this arbitrary and, at times, haphazard way of naming things is hardly an efficient or scientific strategy. I think care must be taken before we slap a name on some new discovery, keeping in mind that perhaps even our perception of it may be distorted or even prejudiced.

If we stand too close to a painting in an art gallery, with our noses almost touching it, we see only brush strokes and patches of color which are probably out of focus as well. It is only when we step back that we can truly appreciate it and take in the whole picture. I think it is the same in trying to make sense of the natural world. Instead of appreciating the entire fern, we have our noses pushed into the rhizomes, peering at scales and looking for teeny-weeny differences in shape and size and color. We then proceed up the stipe to look at more scales or the lack of them. We may even count the scales and discover that our specimens have 55 more scales than those in the next county. We then focus on differences in the shape of pinnae and pinnules and sori and indusia. But there is enough variation in just one species, such as are encountered in the genus *Dryopteris*, that all of the scrutiny may be for nothing. Many of these detailed attributes may be nothing more than the influence of the environment. The point is, we become lost in a quagmire of details that may or may not have any relevance. The casual and often reckless application of names to a specimen we think might be something new just adds to the problem and can be extremely confusing and misleading.

In the animal kingdom, the unit of classification that is often initially focused on is the unit of “family”. The cat family, Felidae, is a good example. A cat is a cat is a cat no matter where we go in the world. They are all recognizable whether we are looking at a lion or a tiger or a cheetah, or a bobcat. (Oh my!) It is quite obvious that they are all related and most likely descended from some ancestral stock. The horse family, Equidae, is another example. A horse is a horse, of course, of course. In the plant kingdom the unit of “genus” is usually the focal point and it is obvious that within this unit much variation is possible. The genus *Polystichum*, for the most part is rather easily recognized, but when it comes to confidently identifying some species of this genus, that can be problematic. In a letter to me, Barbara Joe Hoshizaki said: “*Polystichum* are like *Dryopteris*, very difficult to identify and even harder when no one knows to what country the fern is native.” {16} In our attempt to deal with this bewildering jungle we call speciation, it is all well and good that we study details to differentiate species and try to place some sense of order to it all, but if we become immersed in too much detail, this can be the proverbial fuse that ignites controversy. When we get further embroiled in the fray over subspecies and varieties, the controversy can really heat up.

When we reach this point, we have effectively taken the joy out of enjoy and we are left with “en”. If we consult a dictionary, “en” in suffix form is used to form “plurals” or to form “diminutives” – “to make small or tiny”. It’s a small jump to “diminish” which means “to reduce”, “to pick apart”. We run the risk of reducing nature from something to enjoy to something that has become an annoyance because of disputation and controversy. In my opinion, this does not further the aims of science, nor does

it make science fun. Isaiah wrote: "Come and let us reason together." That is sound advice, even if you've rarely opened a Bible. However, reason and logic are tossed out the window when we allow argument and emotion to take over. Mr. Spock on Star Trek would have been a great botanist. He was all about logic. I can just imagine Bones saying: "D--- it Spock! I'm a doctor, not a pteridologist!" Passionate or sensational disputations over details, especially ridiculous details, are an exercise in futility. We are on a fool's errand. We have reduced the whole thing to absurdity, or perhaps the need to go to extremes in setting things in order borders on obsessive-compulsive behavior. We may have a deep-seated psychological problem.

I firmly believe that we can more effectively proceed with the advancement of knowledge and science if we just calm down, chill out, and stop over-reacting to every differing opinion or idea. It is important to keep in mind that science moves forward because of different ideas. Let's be logical. When we stop to consider that "The debate over species definitions is far from over and is more than a mere academic spat." {4} we must realize that if we are unable to clearly define what a species is, how on earth are we going to seriously consider or define with any degree of certainty smaller biological units such as so-called subspecies and varieties.

It is said that intelligence demands variety. The world would be an excruciatingly boring place without diversity. Therefore, we should use our intelligence wisely and not allow our senses to become overwhelmed when we scrutinize things too closely. If we do this to other human beings, we see flaws and imperfections in them. We may become critical of them. We may diminish them. Then we appreciate them less. Relationships suffer. Here again, we've lost the joy. So rather than being caught up in the maelstrom and uproar of ideas and opinions that twenty years from now or maybe even a month from now will be obsolete and have no meaning, let's all just relax and settle down. Take a walk in the woods and enjoy nature in all her glory, admiring the incredible diversity rather than haggling about it. A walk in the woods is far more enjoyable when you have others there to enjoy it with.

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Mark your calendars!

**HFF Fern Festival
June 2nd and 3rd, 2017**

*Hundreds of beautiful ferns and
companion plants.*

**Center for Urban Horticulture
Seattle, WA**

Lepisorus thunbergianus

The Endurer on the Eaves

Daniel Mount ~ Carnation, WA

I was only on the ground for a few short hours, last October, before I saw my first fern on Japanese soil. Actually it wasn't on soil per se, but up in the crotch of one of the cherry trees lining the driveway leading to our hotel. It was the weeping fern (*Lepisorus thunbergianus*). And I would see it again and again, over the next 10 days as I travelled around central Japan with members of the Hardy Fern Foundation and the British Pteridological Society. (See Dan Yansura's articles about this trip in this and the previous issue)

The esoteric Buddhists of Japan divide the world into two life forms "ujo", the desiring, which includes humans and animals, and "hijo", the non-desiring, which includes plants and stones. I wish taxonomists had as simplistic a view of ferns. During our ten-day trip we saw near 70 genera of ferns and fern allies, over half of those were new to me, including *Lepisorus*. And that was only a small portion of the ferns native to Japan.

According to the *Flora of China* there are about 80 species of *Lepisorus* mostly in tropical and subtropical East Asia, though there are a few species as far west as Eastern Africa and one indigenous to the Hawaiian islands, the weedy weeping fern I saw in Japan, *L. thunbergianus*.

In Japan there are only a handful of *Lepisorus* species, and we saw only 3 on this trip. Yet *L. thunbergianus* we saw repeatedly, and in mass. It is Japan's most widespread and common epiphytic fern. And we saw a lot of epiphytes on this trip. *L. thunbergianus* we saw in forests, along rural roadways and in the hearts of cities. A US-expat botanist living in Japan, known simply as "Botany Boy" on the web, claims, "Some of the densest colonies I've seen are in urban parks and cemeteries". *Lepisorus*, a member of the Polypodiaceae, and is closely aligned with the genera *Belvisia*, *Drymotaenium* and *Pleopeltis*, a genus to which it once belonged. It is complex both cytologically and morphologically, and many taxa are still inadequately known.

One of the first accounts by Europeans of the genus is by Carl Peter Thunberg. A Swedish surgeon and apostle of Carl Linnaeus, he traveled to Japan with the Dutch East India Company in 1775 as a doctor, but spent a great deal of time botanizing. His travels in Japan were limited to Deshima, an artificial island in the Bay of Nagasaki, so his first



Seattle enthusiast Mary Palmer photographs *L. thunbergianus* at a Shinto shrine in the heart of Tokyo's fashion district.

botanical studies were conducted on the livestock fodder brought to the island by the locals. Later he requested plants. The weeping fern was one of those plants brought to him. He described and drew it naming it *Polypodium lineare*, a name which stuck until the mid-19th century.

The Japanese call it “noki shinobu”—roughly translated as “the endurer on the eaves”. It is a popular pot plant there. An extremely variable species in blade size and shape, there are many named cultivars in Japan. It is very adaptable as to habitat and hardy to 24 degrees F, and though found mostly near sea level, it can be found as high as 800 meters in some parts of Japan. And as far north as the island of Hokkaido, it appears as a small protected population in the southwest end of the island. Over the course of the trip we saw it on trees, walls, the metal grating of a catwalk and, of course, on roofs, though it would be content to grow in sphagnum moss in a terracotta pot. It does come with a caveat; it has a tendency to be weedy in greenhouses and in subtropical climates - probably why I could find none for sale here in the States.

Though we had visited some very tranquil places, I was definitely travelling with the desiring. The vigor with which each day started and the exhaustion with which it ended were indicators of just how curious, enthused and desirous we all were to see new ferns each day. The final tally was over 230 ferns

I was so happy to see some of my garden favorites like autumn fern (*Dryopteris erythrosora*) and thick-stemmed wood fern (*D. crassirhizoma*) growing in their native habitats. I was even happier to add new ferns to my favorites list like the elegant *Pteris kiushiuensis*, and the stunningly primitive and hosta-like *Cheiropleuria integrifolia*. Still that first fern I saw stuck with me leaving a desire unfulfilled. Why hadn't I plucked a bit of *L. thunbergianus* rhizome? Secreted it away in the nether reaches of my suitcase? Babied it through the winter under the glass in my laundry room, where all the other marginally hardy ferns I own spend the winter?

Why? Maybe it is just our Buddhist fate to always desire. It is so human after all. So I returned also content with my desire for another trip to Japan and another chance at snatching a piece of the weeping fern.

Daniel Mount lives and farms in the flood plain of the Snoqualmie River, east of Seattle Washington. He can be reached at daniel@mountgardens.com, especially if you have a piece of *L. thunbergianus* you'd like to share.

All photos courtesy of Daniel Mount.



C.P. Thunberg's 1776 drawing of *Polypodium lineare* (later *Lepisorus thunbergianus*)

Richie's Ireland – United Kingdom Travelogue

June – July 2016 ~ PART 3

Richie Steffen ~ Federal Way, WA

July 2, 2016 Saturday – Crooklands Hotel Opening Night of the BPS National Meeting

Left Glasgow and drove 3 hours south to the small town of Kendal where our hotel was near for the BPS National Meeting and Celebration of the 125th Anniversary of the organization. When we arrived at the hotel there were familiar faces in the parking lot. As soon as we parked we became immersed in conversation with friends.

The official name for the event was the British Pteridological Society's Annual National Field Meeting and Celebration of its 125th Anniversary. Each day started with field trips to locations in the wild and noted area gardens in the South Lakes District, returning for dinner followed by a lecture. The South Lakes District and the Kendal area were selected because it is where the organization began. This was the first time I'd traveled in the Lakes District and it is credited with being one of the most beautiful areas in England.

All checked in and settled. I began to run through the opening program I was that tonight, but never had a chance to get more than part way through as, all of sudden, it was time for me to dash off to the lecture hall to check the AV. Between setting up my presentation, social greetings and conversation the opening dinner was upon us! I quickly changed clothes and met folks for a before dinner drink, then upstairs to the banquet hall followed by the opening lecture. The lecture was well received, even with it starting at 8:30pm after dinner! It looked like these were going to be long, but fun days ahead!

July 3, 2016 Sunday – Arnside, Bolton Collection, Hutton Roof

Up at 6:30am today as we needed to be on the road by 8:15am to the first destination of the day. The first stop was a small bay side village called Arnside near a park. The walls across from the parking lot were dotted with choice wall ferns, most extremely difficult for us to grow in the Pacific Northwest. One of my favorites is the rusty back fern, *Asplenium ceterach*. It grew happily with wall rue, *Asplenium ruta-muraria*, Hart's tongue fern, *Asplenium scolopendrium*, and the lime loving form of maidenhair spleenwort, *Asplenium trichomanes* subsp. *quadrivalens*. We stopped in this site to see a rare population of southern maidenhair fern, *Adiantum capillus-veneris*, a more common species in Southern Europe and Southern North America, but quite rare in the UK. The small colony grew in cliff crevices near the shoreline of the bay.

The next stop of the day was a nearby woodland called Grubbins Wood. This area is a Cumbria Wildlife Reserve and one of the few native remaining woodlands in England.



The woods covered a hillside on limestone and was a mix of yews, ash and hazel trees. By our standards it is a fairly short forest with the trees rarely reaching over 40 feet tall. These old forests were managed woodlands until about 100 years ago so many of these trees showed signs of coppicing (being cut to the ground and allowed to regrow) from years past. The wood would have been used for many things, but not building.



We saw our first sighting of limestone buckler fern, *Dryopteris submontana*, at its lowest elevation ever recorded. It was not an impressive specimen at this site, I looked forward to seeing it in a more suitable habitat. One of the more impressive sights was seeing mass stands of the Hart's tongue fern, *Asplenium scolopendrium*, with hundreds of plants covering hillsides. Wild garlic, *Allium ursinum*, grew in abundance in several areas. This is an edible crop and has gain popularity recently in culinary circles. It had just finished flowering with mature seed pods forming future crops.



Hart's tongue fern

Wild Garlic

Returning to the cars, the next stop was a small garden. Robert Bolton was one of the founders of the BPS and he had one of the best collections of fern cultivars during Victorian times. His original collection has been passed from family member to family member for over a hundred years. We were visiting the famous Bolton Collection. The Collection no longer numbers in the hundreds, but does contain some of the finest examples of cultivars known, including one of the most sought after and elusive fern cultivars to obtain, *Asplenium scolopendrium* 'Bolton's Nobile'. It is an extremely wide and short leaf form of Hart's tongue fern, with a gracefully wavy edge and lovely compact habit. The true plant is very rare. The garden also had some of the best *Athyrium filix-femina* 'Gemmatum' (a form of lady fern) with large full crests on the tips of the leaves looking like freshly clipped poodles. There were also exceptional cruciate lady ferns with long narrow fronds lined with stubby X-patterned leaflets. This garden was a true treasure only to be nearly matched a short distance up the road. Discovered by chance just a year ago is a duplication of the Bolton Collection. It is thought that these exceptional forms of many fern species were sold to a neighboring family decades earlier. The second collection was in need of care when found, but is now the pride and joy of the current owners who recently purchased the house.





Hutton Roof was the last stop of the day. Hutton Roof is a National Nature Reserve renowned for its limestone pavement and rare flora. Bryan York, a local naturalist and fern enthusiast, met us there and led the tour. Bryan rediscovered the alpine holly fern, *Polystichum lonchitis*, after it had not been seen in over 55 years at this location and rediscovered the green maidenhair spleenwort, *Asplenium viride*, not seen in 10 years.



Alpine holly fern



Green maidenhair spleenwort

The hike was a steady climb through managed and wild forests. Soon we reached exposed limestone pavement. This was relatively flat limestone with wide cracks and crevices that allowed many rare plants to thrive. The space was open with trees dotting the area and many ferns. We quickly found several large patches of *Dryopteris submontana* and the limestone oak fern, *Gymnocarpium robertianum*. The oak fern is much less robust than our native forming small colonies and running along rock crevices. As we continued to the top we waded through fields of bracken fern, thick and dense and

about 4 to 5 feet tall. We were only able to find a narrow trail through it. Reaching the summit we had vast views of the surrounding area; it is beautiful countryside. A short walk from the top we reached the two sites of the newly rediscovered ferns. After a little observation we started our long hike back to the cars to return to the hotel for dinner.



The evening lecture started at 8:30pm and noted fern species and cultivar expert, writer and nurseryman, Martin Rickard gave a presentation on wild found cultivars of Irish polypody ferns. Surprisingly, we likely drove by some of these selections when we were in Ireland!

July 4, 2016 Monday – Whitbarrow

Today was an all day hike at Whitbarrow, a protected land of limestone pavement, scenic beauty and rare ferns. Sue and Loyd took the day off to see garden sites near town and I caught a ride with Martin Rickard and a second group from Seattle. As I chatted in the back seat I noticed that we were soon lost and had to wind our way through very narrow, tight roads in a small village until we found the right road and arrived at the trail head. We hiked through a low forest with occasional openings of limestone pavement. Several wooded areas contained a lot of birch making for a very picturesque walk. About lunch time we reached open fields and after crossing a stone wall we made the short hike to the summit where we had lunch. A small group of cows had made it to the summit before us and lingered around as we ate. One cow was quite curious and kept coming over to see what people were eating. She had to be chased off several times! The views today were even more amazing than yesterday – vast expanses over the bay and surrounding low mountains. We looked for ferns as we descended, finding some beautiful specimens of species we had seen over the last few days.



Next destination: Roudsea Woods and Humphrey Head

The Fern Tour of Japan – November 2016

Part 1 Northern Area

Daniel Yansura ~ Pacifica, CA

Sunday Oct. 2, - Arrival in Tokyo

We all arrived in Tokyo, and shuttled to our nearby hotel in Narita. Well, almost everyone arrived: Judith Jones had some travel difficulties and joined us the next day. All of us were tired but excited, and after a brief meeting in the hotel lobby, where we met Mr. Sahashi, the Nippon Fernist Club Chairman, we headed out for our first Japanese dinner.

Monday Oct. 3 – Fukushima and Shinohuyama

Much of this day was spent traveling, first by train to Tokyo, and then by bullet train to the city of Fukushima. After finally arriving at our hotel midafternoon, we were introduced to our main guide, Mr. Hisato Yamada, then boarded a bus and headed out to the nearby mountain park of Shinohuyama. Here we found our first Japanese ferns, including many of the basic ferns we would see almost every day. These included *Equisetum arvense*, *Dryopteris erythrosora*, *Blechnum niponicum*, *Cyrtomium fortunei*, *Arachniodes standishii*, *Asplenium incisum*, etc. Almost all of the ferns were terrestrial. In general, epiphytic ferns were relatively rare in the north, but very abundant in the south, due to differences in rainfall. We did find, though, a few *Lepisorus thunbergianus*; this delightful little epiphyte, with a simple frond that is 2-4 inches long, is one of my favorites. At the end of the trail, we reached the top of the small mountain and had a wonderful view of the city of Fukushima. Although the hike was short, we all enjoyed seeing so many ferns in so small an area, and it was a good start to the tour.

Tuesday Oct. 4 - Bandai-Asahi National Park

On our first full day out, we traveled west by bus from our Fukushima hotel to the mountains of Bandai-Asahi National Park. The mountains were rugged and largely barren, and I wondered what tough ferns might be growing there.

We started hiking from the visitor center in the shadow of Mt. Azuma-kofuji, at 4,800 ft. elevation, and walked toward a flat area with a series of boardwalks over alpine meadows. The wind was strong and we struggled a bit to stay on the boardwalks as we worked our way across, enjoying the beautifully-colored alpine vegetation growing in the mud below us. Soon we began seeing some lycophytes mixed in with the low-lying vegetation, first *Huperzia serrata* (photo right) and then *Lycopodium complanatum*, sometimes intertwining with the other plants and sometimes in large patches. We all got down on our knees to take pictures, struggling to maintain our balance on the narrow boardwalk while Japanese tourists worked their way around us. After lunch at the visitor center, we started off on a second hike, this time into a shrub and forested area. *Blechnum niponicum*, *Polystichum tripterum*, *Osmunda japonica* and some other ferns we had seen the previous day were abundant as we moved farther into the forest. After crossing a small stream, we saw our first *Blechnum castaneum*, soon followed by a few more. This fern looks very similar to *B. niponicum*, but has a black stipe



and rachis, which make it particularly attractive. As we continued past the stream, this beautiful *Blechnum* was, unfortunately, no longer seen, and we surmised that it grows best near water. Most of the ferns in the Fukushima Prefecture grew in the ground, but we also checked the trees for epiphytes, and occasionally saw *Lepisorus thunbergianus*, which in itself was a treat for me. But then someone spotted *Polypodium fauriei* up in a tree branch. It was too high to observe in any detail, but Pat Acock managed to stand on Paul Ripley's back to get a fertile frond, while the rest of us had to be satisfied with zooming in for pictures.

As the hike and day ended we went through some geothermal areas and could see the steam rising into the darkening sky. Before reaching our awaiting bus, we walked by Noji resort with a wonderfully landscaped entrance and noticed a good strand of *Blechnum amabile* planted beneath some large rocks. This rather small *Blechnum* does not have a crown but spreads with a growing rhizome. Mr. Yamada noticed our excitement with this lovely *Blechnum* and would reward us with some of it at the end of our northern tour.

That evening we stayed at the Urabandai Royal Hotel, with its charming onsen for after-dinner relaxation. It was dark by the time we reached the hotel, and little did we know of the exciting assortment of ferns growing just outside.

Wednesday Oct. 5 - Ebara Lake area

In the morning before breakfast many of us went outside to search the surrounding area for ferns, exchanging greetings as we ran into each other. We were delighted to find magnificent specimens of *Dryopteris crassirhizoma*, *Polystichum tripteron*, *Asplenium scolopendrium*, and others, including several *Botrychiums*.

After a splendid Japanese breakfast, we took a short bus ride to an area near our previous day's hike. The area was wooded, and off to the side of the trail we saw ferns similar to the ones we found near the hotel, as well as *Osmunda japonica* and *Dryopteris monticola*. There was also *Dennstaedtia wilfordii*, a small but unusual looking fern, and I was pleased to be able to get spore. (photo right) *Botrychium multifidum* was spotted as well, just before we approached an emerald blue lake, where dissolved minerals from geothermal activity apparently enhanced the lake color.

After lunch we drove along the eastern shore of Urabandai Lake. Soon we stopped along the road, where we headed directly into the forest, following no path. The shaded understory now unfolded into a magnificent stand of very large *Dryopteris crassirhizoma* and *Polystichum tripteron*. (photos below) New additions were *Dryopteris tokyoensis*, with its distinct pinnae, as well as its hybrid with *D. uniformis*. On a nearby tree, Martin Rickard finally located a colony of



Polypodium fauriei, this time close enough to the ground for careful inspection.

As the day was ending, we continued our ride around Urabandai Lake, stopping in the southwest corner where some small streams fed into the lake. We walked down to one of the streams, removed our boots, rolled up our pants, and, with difficulty, crossed. On the opposite bank we put our boots back on and walked a short distance to a large mud flat at the entrance to the lake. As we got closer to the water's edge,



Botrychium multifidum var. *robustum*



Dryopteris crassirhizoma

we began seeing small tufts of the grass-looking leaves of *Isoetes japonica*. The plants were about 3-4 inches tall, and formed a beautiful rosette. A cross section of a leaf was passed around the group, and four air channels could easily be observed. The corm part positioned in the mud was also examined and after squeezing it a bit, spores were released. The megaspores could easily be seen with the naked eye, and with a hand lens the beautiful trilete



Polystichum tripteron

markings could be detected. This was my first finding of an *Isoetes* in the wild after looking for many years, and I was delighted.

Thursday Oct. 6 - Watase Wind Caves

This morning we took a two-hour bus ride to the city of Sendai in the Miyagi Prefecture, just north of Fukushima. After arriving at the Library Hotel Sendai, we met Mr. Yuki Ueno, our main guide for this area. We traveled by bus through a mountainous area to a reservoir, stopping just short of a tunnel. On the steep vertical rock wall we discovered many plants of *Woodsia polystichoides* and a few of *Woodsia macrochlaena*, which many in the group found adorable. We also saw *Selaginella helvetica*, *S. tamariscina* and single plants of *Asplenium tenuicale* and *Adiantum monochlamys*. The *S. tamariscina* were high up on the wall and we could not observe them in any detail.

After a lunch break we took a hike in a nearby wooded area, finding many of the usual ferns such as *Adiantum pedatum*, *Asplenium scolopendrium*, *Osmunda japonica*, and *Polystichum tripterum*. New ferns were *Dryopteris polylepis* and *D. bissetiana*. Soon we reached our intended goal, the Watase Wind Caves. This was actually a man-made rock wall (around 5 ft tall) that was used to control the wind for growing silkworms in past times. While the rock wall contained few ferns, just uphill was located *Gymnocarpium dryopteris*. We quickly took pictures and returned to the trail as a band of monkeys threatened us with their calls. On the trail we observed *Polystichum ovatopaleaceum*, *Botrychium virginianum*, *B. niponicum*, and a rather poisonous looking snake climbing up the steps to a viewpoint!

Friday Oct. 7 – Sendai Forest Preserve

We started our last day in the north with a hike in a forest preserve outside Sendai. Along a wide path we saw many of the usual ferns, *Anisocampium niponicum*, (*Athyrium niponicum*), *Arachniodes standishii*, *Blechnum niponicum*, *Cyrtomium fortunei*, *Arachniodes borealis*, and *Dryopteris crassirhizoma*. *Deparia conilii* and *D. japonica*, although not new to our sightings, were now in great abundance and mixed in large colonies. This gave us the opportunity to sort out the more subtle differences between these two similar-looking species. I was also pleased to see large plants of *Dennstaedtia wilfordii*, with its thick leaves and marginal sori. A new fern for the tour, *Selliguea hastata*, which usually has simple small fronds (although they can occasionally be lobed), was discovered growing on the side of a loamy-clay bank lining the trail. Additionally, *Deparia orientalis* was spotted, and while somewhat similar to *D. conilii* and *D. japonica*, was very much larger. After a while we entered a rather open area with only a few trees and discovered *Botrychium niponicum*, *B. ternatum*, and *B. virginianum*, all growing together in great numbers.

After lunch we hiked in a different area and were somewhat disappointed to see the same ferns we saw that morning. About half a mile in, though, our guides shunted

us off into the dense, dark forest with no trail and a heavy understory of ferns. Due to the low light and protection from the trees, the mixture of ferns (mostly *Dryopteris*, *Polystichum*, *Arachniodes*, and *Coniogramme*) grew to great sizes. Mr. Yuki Ueno knew of some special ferns, though, interspersed among the common ones. *Dryopsis maximowicziana* was a medium-sized fern with abundant white scales on the stipe and rachis. *Leptorumohra miqueliana* (also called *Arachniodes miqueliana*) had a rather clean reddish/brown stipe and rachis, and quadripinnate fronds. *Rachidosorus mesosorus* (also called *Diplazium mesosorus*), with reddish/brown-polished stipe, had sori which looked more like a chain fern than a *Diplazium*. (photo right) Finally, *Macrothelypteris torresiana* was tripinnate to quadripinnatifid, with soft herbaceous leaves. All of these new ferns had distinctive characteristics, but all were difficult to pick out from the abundant, more common ferns.



As we drove back to our hotel, Mr. Yamada passed along a large bag of *Blechnum amabile* rhizomes from Mr. Ueno’s garden, and we were all allowed to take some of this small delightful fern.

All photos courtesy of Dan Yansura

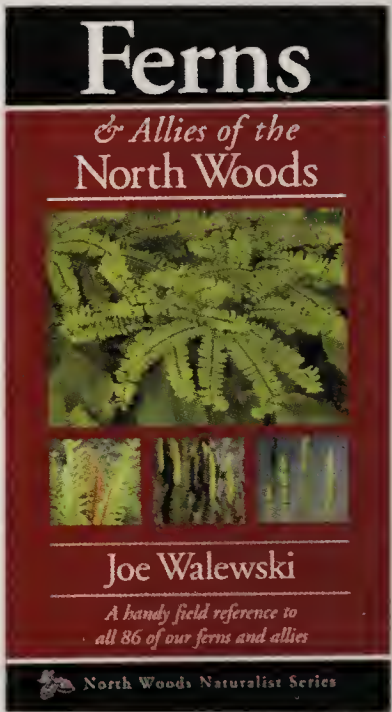
Book Review

Ferns and Allies of the North Woods

Joe Walewski, 2016

Kollath+Stensaas Publishing, 394 Lake Ave. South,
Duluth MN 55802

Reviewed by Joan Eiger Gottlieb



I was drawn instantly into this little field guide by the second sentence of the first page - “Ferns are magical, beautiful, accessible, and mysterious.” And Joe Walewski, its author, treats the reader to all these ferny qualities through stunning color photographs, including close-ups of distinguishing details like the sheath teeth of scouring rushes (*Equisetum*) and the “pinnae” and eusporangia of moonworts (*Botrychium*). Facing pages devoted to each species contain such photos, along with captivating “Nature

Notes,” distribution maps, plant descriptions, comparisons with similar species, even hybrid alerts. Here is an example of the latter from p. 116 - “Crested wood fern (*Dryopteris cristata*) hybridizes with five species. All the hybrids can be identified by overall narrow blades and triangular basal pinnae.”

The book sub-title is “A handy reference to all 86 of our ferns and allies,” and “our ferns” refers to those that are native to Minnesota, Wisconsin, and Michigan - the “North Woods” as stated for the scope of this volume. However, at least half of the included species are found far beyond the borders of those three mid-western states, greatly extending the usefulness of the book.

The first 26 pages are a cut above the usual introductory stuff. They include an enchanting essay “Welcome to the Magic,” a simplified, but clear “Age of Ferns” chart tracing pteridophyte lines through 425 million years of evolution, an exposé of the fern life cycle titled “No Birds or Bees Required,” recommendations on “Searching for Ferns,” “Using this Book,” and a full five pages of “Fiddleheads” - outstanding close-ups of unfurling croziers “for identification purposes instead of collecting.” There is even a highlighted (in red) warning paragraph about the dangers of eating fiddleheads (not only toxic and carcinogenic, but as a fern lover I would say arguably cannibalistic). The volume ends with an inclusive index (scientific and common names), a useful glossary, especially if you need to brush up on “eusporangiate” vs. “leptosporangiate,” and a nice list of related books, including a favorite of mine - Robbin Moran’s *A Natural History of Ferns*, 2004, Timber Press.

I really liked Walewski’s comprehensive coverage of the moonworts (*Botrychium*), with nine species forming a distributional hot spot in the North Woods states. These Lilliputian ferns (under 5” tall in most cases) favor the dunes, old fields, and abandoned orchards along Great Lakes shorelines. Two memorable experiences of my botanical life occurred in June 1989 when I participated in “Ferns of Northern Michigan,” a course taught by Joseph (Joe) Beitel of the New York Botanical Garden, and in June 1990 during a spectacular Michigan foray (preceding the International Association of Pteridologists meeting in Ann Arbor) led by University of Michigan professors, Drs. Warren (Herb) and Florence Wagner. The multi-talented Herb Wagner specialized in “moonwort madness” (when he wasn’t playing the piano by ear or casting his omnipresent insect net over some unsuspecting lepidopteran). The Wagners’ studies of hybridization and new species formation among moonworts, along with their iconic black and white species silhouettes, are given well-deserved recognition by Walewski on p. 66. Both course and foray participants were encouraged to develop a “search image” for likely moonwort habitats, and then, as Walewski puts it, to “assume the moonwort position - on your hands and knees.” I remember finding my first specimen - a fully formed and flagrantly fertile *B. lunaria*. Knowing that it was among the largest and most common species did not in the least diminish my delight and sense of accomplishment. A “must read” for anyone interested in the science behind moonwort taxonomy (starch gel electrophoresis, DNA sequencing, and gene silencing) is Donald R. Farrar’s outstanding 2011 paper “Systematics and taxonomy of genus *Botrychium*” in *The Historical Review of Taxonomy...* (pdf file available with a Google search).

Curiously, Walewski devotes p. 62 of the book to an explanation of the “newer taxonomy” that separates moonworts (*Botrychium*) from grapeferns (*Sceptridium*) and rattlesnake fern (*Botrypus*), but then regresses to lumping them all together in the genus (*Botrychium*) in subsequent pages. Another lapse from current taxonomic norm (even from *Flora of North America* Vol. 2, 1993, Oxford Univ. Press, which Walewski cites (p.20) as his main source for scientific names) occurs in the section on lycopods (clubmosses). He assigns the bristly clubmoss (*Lycopodium annotinum*) to a segregate genus *Spinulum* and the arborescent species (*L. dendroideum*, *obscurum*, and *hickeyi*) to yet another segregate genus *Dendrolycopodium*, adopting questionable proposals of Arthur Haines in a self-published 2003 manual on the clubmosses of New England that I reviewed in the HFF Quarterly, Spring, 2006. Joe Beitel, contributor par excellence to our understanding of lycopod relationships, made the scientific case for taxonomic consideration of gametophyte characteristics which are highly conserved in evolution. All members of the genus *Lycopodium* have indistinguishable, button (disc-shaped), under-ground sexual plants, a fact that argues powerfully against generic splitting.

A better divergence from the *Flora of North America* (not taken by Walewski) would be the placement of cinnamon fern (formerly *Osmunda cinnamomea*) into its new, segregant genus *Osmundastrum cinnamomeum*. Morphological and molecular studies of this ancient and widespread fern form a body of evidence that relates it to its sister osmundas, but puts it on a different branch of the family. There is a taxonomic imperative for monophyletic groupings (all members of a named genus or higher group level must be on a common, genetically continuous evolutionary line).

Do not be deterred by a few taxonomic issues. *Ferns & Allies of the North Woods* is a terrific field guide, written with a minimum of jargon and a maximum of useful information, often wrapped in a bit of endearing folklore and history. There is no skimping on helpful illustrations. The 168-page volume has a user-friendly format, is printed on heavy weight glossy paper, and has a very durable cover, all of special value considering the time and weather constraints of field work. In addition, the field user will find it handy and speedy to run a thumb down the open edge of the book where staggered index labels mark the opening sections on “clubmosses,” “spikemosses,” “quillworts,” “horsetails,” and “moonworts.” The second half of the volume, where the more familiar leptosporangiate ferns are covered, is indexed by habitat - “forests,” “wet areas,” and “rocky areas.” Anyone interested in ferns and other ancient plants should slip this 4 1/2 x 8” guide into a backpack before hiking in the “mysterious wild” of the Great Lakes states and beyond.

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